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10/814,294	04/01/2004	Paul Thurk	040897-0114	6127

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EXAMINER

WON, BUMSUK

ART UNIT	PAPER NUMBER
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2879

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary**Application No.**

10/814,294

Applicant(s)

THURK, PAUL

Examiner

Bumsuk Won

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.

- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-16, 18, 19, 22, 23, 30, 32-39, 42-46 and 52-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-16, 18, 19, 22, 23, 30, 32-39, 42-46, 52-71 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-918) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Response to Amendment

The amendment filed on 10/25/2006 has been entered.

Response to Arguments

Applicant's arguments filed on 12/25/2006 have been fully considered but they are not persuasive.

Regarding the rejection of claims 13-16, 19, 22, 23, 30, 32-34, 36, 38, 42-46, and 52-66 under 35 U.S.C. 103(a), the Applicant argues on pages 7-11 that the prior arts Mikhael (2003/0080677) and Korgel (6,918,946) neither teach nor suggest the claimed light emitting devices and method of making, specifically, the instant application teaches Group IV nanostructures are new materials having unique properties suited for lighting applications whereas the cited references do not teach the same new material of Group IV nanostructures. The Examiner agrees that the specific material of the Group IV nanostructure of Korgel may be different from the instant application. However, the independent claims of 13, 32, and 42 do not claim the specific new material of Group IV nanostructure. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Claim Objections

Claims 33-39, 57-61, and 67-71 are objected to because of the following informalities:

Regarding the independent claims 67 and 70, "adapted to" is not a positive recitation. For examining purpose, the phrase will be assumed as "the substrate is laminally disposed". Appropriate correction is required. Claims 33-39, 57-61, and 68-69 are objected to due to claim dependency.

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Regarding the independent claims 67 and 70, “the first electrode material” and “the second electrode material” should be “the first electrode layer” and “the second electrode layer”. Appropriate correction is required. Claims 33-39, 57-61, and 68-69 are objected to due to claim dependency.

Regarding the independent claim 71, “wherein the substrate material may be” should be “wherein the substrate material is”. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-16, 19, 22, 23, 30, 32-34, 36, 38, 42-46 and 52-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikhael (US 2003/0080677) in view of Korgel (US 6,918,946).

Regarding claim 13, Mikhael discloses a light-emitting device (figure 2) comprising a substrate (46) and a planar light-emitting subassembly (other items) shaped like the substrate (shape of 46 is a flat tube while other items' shape is a flat tube) and disposed on the substrate in a laminar arrangement (figure 2), wherein the substrate comprises two opposing flat faces and a perimeter (46 has top and bottom flat faces and perimeter), and the light-emitting subassembly comprises two opposing flat faces and a perimeter (other items have top and bottom flat faces and perimeter). Mikhael also discloses the light-emitting device is used as light source for ceiling (paragraph 14).

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Mikhael does not disclose the subassembly comprising light-emitting group IV nanoparticles.

Korgel discloses a light-emitting device (figure 5) comprising light-emitting group IV nanoparticles (paragraph 139), for the purpose of enhancing light emission.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light-emitting group IV nanoparticles disclosed by Korgel in the light-emitting device disclosed by Mikhael, for the purpose of enhancing light emission.

Regarding claim 14, Mikhael discloses a first electrical insulation layer (44), upon which is disposed a first electrode layer (42), upon which is disposed a light emitting layer (48, 50), upon which is disposed a second electrode (52), upon which is disposed a second electrical insulation layer (56).

Mikhael does not disclose the light-emitting layer comprises light-emitting group IV nanoparticles.

Korgel discloses a light-emitting device (figure 5) comprising a light-emitting layer (58) having light-emitting group IV nanoparticles (paragraph 139), for the purpose of enhancing light emission. The reason for combining is the same as for claim 13 above.

Regarding claim 15, Mikhael discloses the first electrical insulation layer and the first electrode layer are substantially transparent to the light emitted by the light-emitting layer (paragraph 26).

Regarding claim 16, Mikhael discloses the light-emitting device is adapted to provide contact (figure 2, 58) with a voltage source (paragraph 26).

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Regarding claim 19, Mikhael discloses an electron transport layer (50) and a hole transport layer (48).

Regarding claims 22, 23, 52, 53 and 54, Korgel discloses the group IV nanoparticles are core-shell nanoparticles comprising silicon (paragraph 105). The reason for combining is the same as for claim 13 above.

Regarding claim 30, Korgel discloses white light is emitted using the nanoparticle (paragraph 141). The reason for combining is the same as for claim 13 above.

Regarding claims 43-46, the Examiner notes that use of the light-emitting device for emergency lighting (claim 43), in-door lighting (claim 44), track lighting (claim 45) and direct lighting of an airplane interior (claim 46) are intended use language, and does not differentiate from structure of the light-emitting device disclosed by Mikhael in view of Korgel, therefore, no patentable weight is given to these claims.

Regarding claim 55, Korgel discloses the group IV nanoparticles are Ge nanoparticles (paragraph 126). The reason for combining is the same as for claim 13 above.

Regarding claim 56, Korgel discloses the group IV nanoparticles are Si-Ge alloy nanoparticles (paragraph 118). The reason for combining is the same as for claim 13 above.

Regarding claim 32, Mikhael discloses a light-emitting subassembly (figure 2) comprising a first electrode layer (42), a light-emitting layer (48, 50), and a second electrode layer (52), wherein the subassembly comprises two opposing faces and a perimeter edge (top and bottom surfaces and vertical edges), and wherein the first electrode is transparent to the light emitted by the light-emitting layer (paragraph 26). Mikhael also discloses the light-emitting device is used as light source for ceiling (paragraph 14).

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Mikhael does not disclose the subassembly comprising light-emitting group IV nanoparticles.

Korgel discloses a light-emitting device (figure 5) comprising light-emitting group IV nanoparticles (paragraph 139), for the purpose of enhancing light emission.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light-emitting group IV nanoparticles disclosed by Korgel in the light-emitting device disclosed by Mikhael, for the purpose of enhancing light emission.

Regarding claim 42, Mikhael discloses a method of making a light-emitting subassembly (figure 2) combining a light-emitting layer (48, 50), first and second electrode layers (42, 52), and first and second electrical insulation layers (44, 56), wherein the layers are in laminar arrangement (figure 5), wherein the first electrode is disposed on the first electrical insulation layer, and the first and the first electrical insulation layer are transparent (paragraph 26).

Mikhael does not disclose the light-emitting layer comprising light-emitting group IV nanoparticles.

Korgel discloses a light-emitting layer (figure 5, 58) comprising light-emitting group IV nanoparticles (paragraph 139), for the purpose of enhancing light emission.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light-emitting group IV nanoparticles in a light-emitting layer disclosed by Korgel in the method of making a light-emitting subassembly disclosed by Mikhael, for the purpose of enhancing light emission.

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Regarding claims 62, 65 and 66, Korgel discloses the group IV nanoparticles are core-shell nanoparticles comprising silicon (paragraph 105). The reason for combining is the same as for claim 42 above.

Regarding claim 63, Korgel discloses the group IV nanoparticles are Ge nanoparticles (paragraph 126). The reason for combining is the same as for claim 42 above.

Regarding claim 64, Korgel discloses the group IV nanoparticles are Si-Ge alloy nanoparticles (paragraph 118). The reason for combining is the same as for claim 42 above.

Regarding claim 67, Mikhael discloses a subassembly for a light emitting panel (figure 2) comprising: a first optically transparent insulating substrate material (44) and a second insulating substrate material (54) is laminally disposed on a building panel (46); a first optically transparent electrode layer (42) and a second electrode layer (58), wherein the first electrode layer is laminally disposed on the first insulating substrate, and the second electrode layer is laminally disposed on the second insulating substrate; and a light emitting layer (48, 50) between the first and the second insulating substrates.

Mikhael does not disclose the subassembly comprising light-emitting group IV nanoparticles.

Korgel discloses a light-emitting device (figure 5) comprising light-emitting group IV nanoparticles (paragraph 139), for the purpose of enhancing light emission.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light-emitting group IV nanoparticles disclosed by Korgel in the light-emitting device disclosed by Mikhael, for the purpose of enhancing light emission.

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Regarding claim 33, Mikhael discloses the light-emitting device is adapted to provide contact (figure 2, 58) with a voltage source (paragraph 26).

Regarding claim 34, Korgel discloses the nanostructures are nanoparticles (paragraph 139). The reason for combining is the same as for claim 67 above.

Regarding claims 36 and 38, Mikhael discloses an electron transport layer (50) and a hole transport layer (48).

Regarding claims 57, 60 and 61, Korgel discloses the group IV nanoparticles are core-shell nanoparticles comprising silicon (paragraph 105). The reason for combining is the same as for claim 67 above.

Regarding claim 58, Korgel discloses the group IV nanoparticles are Ge nanoparticles (paragraph 126). The reason for combining is the same as for claim 67 above.

Regarding claim 59, Korgel discloses the group IV nanoparticles are Si-Ge alloy nanoparticles (paragraph 118). The reason for combining is the same as for claim 67 above.

Regarding claim 68, Korgel discloses the nanostructures having an average diameter of between 1 to 100 nm (column 1, lines 22-23). The reason for combining is same as claim 67.

Regarding claim 69, Korgel discloses the nanostructures are organically capped nanostructures (column 2, lines 15-19). The reason for combining is same as claim 68.

Regarding claim 70, Mikhael discloses a subassembly for a light emitting panel (figure 2) comprising: a first optically transparent insulating substrate material (44) and a second insulating substrate material (54) is laminally disposed on a building panel (46); a first optically transparent electrode layer (42) and a second electrode layer (58), wherein the first electrode layer is laminally disposed on the first insulating substrate, and the second electrode layer is

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laminally disposed on the second insulating substrate; and a light emitting layer (48, 50) between the first and the second insulating substrates, wherein the light emitting layer has an photoluminescent component (paragraph 18).

Mikhael does not disclose the subassembly comprising light-emitting group IV nanoparticles.

Korgel discloses a light-emitting device (figure 5) comprising light-emitting group IV nanoparticles (paragraph 139), for the purpose of enhancing light emission.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light-emitting group IV nanoparticles disclosed by Korgel in the light-emitting device disclosed by Mikhael, for the purpose of enhancing light emission.

Claims 18, 35, 37 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikhael (US 2003/0080677) in view of Korgel (US 6,918,946), in further view of Forrest (US 2004/0031966).

Regarding claims 18, 35, 37, and 39, Mikhael in view of Korgel does not disclose a reflective layer.

Forrest discloses a light-emitting device (figure 1) having a reflective layer (160), for the purpose of emitting light in one direction.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a reflective layer disclosed by Forrest in the light-emitting device disclosed by Mikhael in view of Korgel, for the purpose of emitting light in one direction.

Claim 71 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mikhael (US 2003/0080677) in view of Korgel (US 6,918,946), in further view of Hsu (2005/0224765).

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Regarding claim 71, Mikhael discloses a method for making a subassembly for a light emitting panel (figure 2) comprising: a first optically transparent insulating substrate material (44) and a second insulating substrate material (54) is laminally disposed on a building panel (46); a first optically transparent electrode layer (42) and a second electrode layer (58), wherein the first electrode layer is laminally disposed on the first insulating substrate, and the second electrode layer is laminally disposed on the second insulating substrate; and a light emitting layer (48, 50) between the first and the second insulating substrates.

Mikhael does not disclose a method comprising formulating a printable group IV nanoparticle ink composition and the structure being selected to emit at specific wavelength of light.

Korgel discloses a light-emitting device (figure 5) comprising light-emitting group IV nanoparticles (paragraph 139), for the purpose of enhancing light emission.

Hsu discloses a light emitting device (paragraph 2) using nanoparticle ink (paragraph 87), for the purpose of enhancing manufacturability.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light-emitting group IV nanoparticles disclosed by Korgel and nanoparticle ink disclosed by Hsu in the light-emitting device disclosed by Mikhael, for the purpose of enhancing light emission.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bumsuk Won whose telephone number is 571-272-2713. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on 571-272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Bumsuk Won
Patent Examiner



JOSEPH WILLIAMS
PRIMARY EXAMINER